

**WHAT IS CLAIMED IS :**

1 1. A reel-deployable printed circuit board comprising:  
2 an elongated, flexible base board having opposite edges and a slit formed into  
3 it, the slit having an inner periphery defining a unit board within the flexible base  
4 board; and,  
5 a connection bar connecting the unit board to the base board such that the unit  
6 board is pivotable on the connection bar relative to the base board.

1 2. The circuit board of Claim 1, further comprising:  
2 a bonding pad on a top surface of the unit board;  
3 a contact on a bottom surface of the unit board; and,  
4 a via hole through the unit board electrically connecting the bonding pad to the  
5 contact.

1 3. The circuit board of Claim 2, wherein the contact comprises a layer of copper plated  
2 with gold.

1 4. The circuit board of Claim 1, further comprising a dam inside the inner periphery of  
2 the slit.

1 5. The circuit board of Claim 1, wherein the base board is made of a glass-epoxy mate-  
2 rial.

1 6. The circuit board of Claim 1, wherein the base board includes a sprocket hole along at  
2 least one of the edges thereof.

1 7. The circuit board of Claim 1, wherein the base board includes a position hole along  
2 one of the edges thereof.

1 8. The circuit board of Claim 2, further comprising:  
2 a semiconductor chip attached to an upper surface of the unit board, the chip  
3 having a connection pad on an upper surface thereof; and,  
4 a conductive wire having opposite ends, each bonded to a respective one of the  
5 bonding pad on the unit board and the connection pad on the chip.

1 9. The circuit board of Claim 8, further comprising an encapsulant formed on the top  
2 surface of the unit board and encapsulating a region including the chip, the conductive wire,  
3 the bonding pad, and the connection pad.

1 10. A method for manufacturing a semiconductor package using a reel-deployable printed  
2 circuit board, comprising:

3 (A) forming a printed circuit board comprising an elongated, flexible base board hav-  
4 ing opposite edges and a slit cut through it, the slit defining a unit board within the flexible  
5 base board that is connected to the base board and pivotable relative to it by means of a con-  
6 nection bar extending between the two boards in a direction perpendicular to the long direc-  
7 tion of the base board, the unit board having top and bottom surfaces, a bonding pad on the  
8 top surface, a contact on the bottom surface, and a via hole electrically connecting the contact  
9 with the bonding pad;

10 (B) attaching a semiconductor chip to the top surface of the unit board;

11 (C) electrically connecting the semiconductor chip to the bonding pad; and,

12 (D) encapsulating the top surface of the unit board with an encapsulant in a region in-  
13 cluding the semiconductor chip and the bonding pad.

1 11. The method of claim 10, wherein a plurality of semiconductor packages are simulta-  
2 neously manufactured on the printed circuit board, and further comprising: separating the en-  
3 capsulated unit boards from the flexible base board by cutting the connection bars.

1 12. The method of Claim 10, further comprising:

2 winding the printed circuit board onto a cylindrical reel to store the board and  
3 - to transport the board from one manufacturing station to another manufacturing sta-  
4 tion; and,

5 unwinding the printed circuit board from the reel to perform a manufacturing  
6 operation on the board.

1 13. The method of claim 10, further comprising forming a dam on the top surface of the  
2 unit board to prevent runoff of a liquid encapsulant.

1 14. The method of claim 10, wherein the flexible base board is formed from a glass-epoxy  
2 material.

1 15. The method of claim 10, further comprising forming a sprocket hole along at least one  
2 of the edges of the flexible base board.

1 16. The method of claim 10, further comprising forming a position hole along an edge of  
2 the flexible base board.

1 17. The method of claim 10, wherein encapsulating the unit board further comprises:  
2 dispensing a liquid encapsulant into the region; and,  
3 curing the liquid encapsulant.

1 18. The method of claim 10, wherein encapsulating the unit board further comprises:  
2 disposing a mold over the unit board;  
3 transferring a molten encapsulant into the mold; and,  
4 solidifying the encapsulant.

1 19. The method of claim 10, wherein electrically connecting the semiconductor chip to  
2 the bonding pad further comprises bonding a wire having opposite ends to respective ones of  
3 the bonding pad and the chip.

1 20. The method of claim 10, wherein electrically connecting the semiconductor chip to  
2 the bonding pad further comprises:  
3 forming a ball of conductive metal on the bonding pad or on a connection pad  
4 formed on a surface of the chip;  
5 orienting the chip with respect to the unit board such that the bonding pad and  
6 the connecting pad are opposed to each other, with the conductive metal ball inter-  
7 posed therebetween; and,  
8 melting the ball such that it electrically connects the pads to each other.